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FEDERAL TRADE COMMISSION

[File No. 171 0068]

Linde AG and Praxair, Inc.; Analysis to Aid Public Comment

AGENCY: Federal Trade Commission.

ACTION: Proposed Consent Agreement.

SUMMARY: The consent agreement in this matter settles alleged violations of federal law prohibiting unfair methods of competition. The attached Analysis to Aid Public Comment describes both the allegations in the complaint and the terms of the consent orders -- embodied in the consent agreement -- that would settle these allegations.

DATES: Comments must be received on or before November 21, 2018.

ADDRESSES: Interested parties may file a comment online or on paper, by following the instructions in the Request for Comment part of the **SUPPLEMENTARY**

INFORMATION section below. Write: “Linde AG and Praxair, Inc.; File No.

1710068” on your comment, and file your comment online at

<https://ftcpublishcommentworks.com/ftc/praxairlindeinvest/> by following the instructions

on the web-based form. If you prefer to file your comment on paper, write “Linde AG

and Praxair, Inc.; File No. 1710068” on your comment and on the envelope, and mail

your comment to the following address: Federal Trade Commission, Office of the

Secretary, 600 Pennsylvania Avenue NW, Suite CC-5610 (Annex D), Washington, DC

20580, or deliver your comment to the following address: Federal Trade Commission,

Office of the Secretary, Constitution Center, 400 7th Street SW, 5th Floor, Suite 5610

(Annex D), Washington, DC 20024.

FOR FURTHER INFORMATION CONTACT: Jordan S. Andrew (202-326-3678),
Bureau of Competition, 600 Pennsylvania Avenue NW, Washington, DC 20580.

SUPPLEMENTARY INFORMATION: Pursuant to Section 6(f) of the Federal Trade Commission Act, 15 U.S.C. 46(f), and FTC Rule 2.34, 16 CFR § 2.34, notice is hereby given that the above-captioned consent agreement containing a consent order to cease and desist, having been filed with and accepted, subject to final approval, by the Commission, has been placed on the public record for a period of thirty (30) days. The following Analysis to Aid Public Comment describes the terms of the consent agreement, and the allegations in the complaint. An electronic copy of the full text of the consent agreement package can be obtained from the FTC Home Page (for October 22, 2018), on the World Wide Web, at <https://www.ftc.gov/news-events/commission-actions>.

You can file a comment online or on paper. For the Commission to consider your comment, we must receive it on or before November 21, 2018. Write “Linde AG and Praxair, Inc.; File No. 1710068” on your comment. Your comment - including your name and your state - will be placed on the public record of this proceeding, including, to the extent practicable, on the public Commission Website, at <https://www.ftc.gov/policy/public-comments>.

Postal mail addressed to the Commission is subject to delay due to heightened security screening. As a result, we encourage you to submit your comments online. To make sure that the Commission considers your online comment, you must file it at <https://ftcpublic.commentworks.com/ftc/praxairlinedivest/> by following the instructions

on the web-based form. If this Notice appears at <http://www.regulations.gov#!/home>, you also may file a comment through that website.

If you prefer to file your comment on paper, write “Linde AG and Praxair, Inc.; File No. 1710068” on your comment and on the envelope, and mail your comment to the following address: Federal Trade Commission, Office of the Secretary, 600 Pennsylvania Avenue NW, Suite CC-5610 (Annex D), Washington, DC 20580, or deliver your comment to the following address: Federal Trade Commission, Office of the Secretary, Constitution Center, 400 7th Street SW, 5th Floor, Suite 5610 (Annex D), Washington, DC. 20024. If possible, submit your paper comment to the Commission by courier or overnight service.

Because your comment will be placed on the publicly accessible FTC Website at <https://www.ftc.gov>, you are solely responsible for making sure that your comment does not include any sensitive or confidential information. In particular, your comment should not include any sensitive personal information, such as your or anyone else’s Social Security number; date of birth; driver’s license number or other state identification number, or foreign country equivalent; passport number; financial account number; or credit or debit card number. You are also solely responsible for making sure that your comment does not include any sensitive health information, such as medical records or other individually identifiable health information. In addition, your comment should not include any “trade secret or any commercial or financial information which . . . is privileged or confidential” – as provided by Section 6(f) of the FTC Act, 15 U.S.C. 46(f), and FTC Rule 4.10(a)(2), 16 CFR 4.10(a)(2) – including in particular competitively

sensitive information such as costs, sales statistics, inventories, formulas, patterns, devices, manufacturing processes, or customer names.

Comments containing material for which confidential treatment is requested must be filed in paper form, must be clearly labeled “Confidential,” and must comply with FTC Rule 4.9(c). In particular, the written request for confidential treatment that accompanies the comment must include the factual and legal basis for the request, and must identify the specific portions of the comment to be withheld from the public record. *See* FTC Rule 4.9(c). Your comment will be kept confidential only if the General Counsel grants your request in accordance with the law and the public interest. Once your comment has been posted on the public FTC Website – as legally required by FTC Rule 4.9(b) – we cannot redact or remove your comment from the FTC Website, unless you submit a confidentiality request that meets the requirements for such treatment under FTC Rule 4.9(c), and the General Counsel grants that request.

Visit the FTC Website at <http://www.ftc.gov> to read this Notice and the news release describing it. The FTC Act and other laws that the Commission administers permit the collection of public comments to consider and use in this proceeding, as appropriate. The Commission will consider all timely and responsive public comments that it receives on or before November 21, 2018. For information on the Commission’s privacy policy, including routine uses permitted by the Privacy Act, see <https://www.ftc.gov/site-information/privacy-policy>.

Analysis of Proposed Consent Order to Aid Public Comment

I. INTRODUCTION

The Federal Trade Commission (“Commission”) has accepted, subject to final approval, an Agreement Containing Consent Orders (“Consent Agreement”) designed to remedy the anticompetitive effects resulting from the proposed merger of Praxair, Inc. (“Praxair”) and Linde AG (“Linde”).

Pursuant to the Consent Agreement, Linde will divest the following assets to Messer Group GmbH (“Messer”): thirty-two air separation units (“ASUs”); sixteen carbon dioxide facilities; source contracts for nearly one billion cubic feet of helium, twelve helium transfill stations, and a helium purification facility; one liquid hydrogen production facility, as well as equipment, contracts, and related assets. Linde also will divest assets related to its excimer laser gas business to Messer.

Separately, Linde will divest five facilities that produce hydrogen and carbon monoxide (“HyCO”) for on-site customers, along with Linde’s hydrogen pipeline in the Gulf Coast and related customer contracts, to Matheson Tri-Gas, Inc. (“Matheson”). Lastly, Linde will divest two additional HyCO plants to their respective owners. Linde will divest its HyCO plant in Clear Lake, Texas to Celanese Corporation (“Celanese”) and its HyCO plant in La Porte, Texas to LyondellBasell Industries N.V. (“LyondellBasell”).

Praxair and Linde have agreed to divest the required facilities and assets to the aforementioned buyers, or to alternative Commission-approved buyers, within 120 days after signing the Consent Agreement. Praxair and Linde will hold their businesses separate until they have accomplished the divestitures to Messer and Matheson. The

divestiture of these facilities and related assets will preserve the competition between Praxair and Linde that the proposed merger would otherwise eliminate.

The proposed Consent Agreement will be on the public record for thirty days, so that interested persons may submit comments. Comments that the Commission receives during this period will become part of the public record. After thirty days, the Commission will again review the proposed Consent Agreement and the comments received, and will decide whether it should withdraw from the proposed Consent Agreement, modify it, or make final the accompanying Decision and Order.

II. THE TRANSACTION

On June 1, 2017, Linde and Praxair entered into an agreement and plan of merger, in a transaction valued at approximately \$80 billion. Pursuant to the terms of their agreement, the parties will initiate a stock-for-stock exchange to form a new company under the Linde name with headquarters split between Danbury, Connecticut and Munich, Germany. The Commission's Complaint alleges that the proposed merger, if consummated, would violate Section 7 of the Clayton Act, as amended, 15 U.S.C. § 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. § 45, by substantially lessening competition in the United States in markets for bulk liquid oxygen; bulk liquid nitrogen; bulk liquid argon; bulk liquid carbon dioxide; bulk liquid hydrogen; bulk refined helium; on-site hydrogen; on-site carbon monoxide; and excimer laser gases.

III. THE PARTIES

Praxair is an international industrial gas and surface technology company headquartered in Danbury, Connecticut. The company primarily serves industrial and

specialty gas customers in manufacturing, metals, and chemicals industries. Praxair is the third-largest industrial gas supplier globally by revenue. In the United States, Praxair owns forty-one ASUs and twenty-eight carbon dioxide facilities. In 2017, Praxair's revenue totaled approximately \$11.4 billion, about \$5 billion of which derived from business in the United States.

Linde, headquartered in Munich, Germany, is a global supplier of industrial gases, homecare respiratory services, and engineering services to customers in the healthcare, chemicals, and energy industries. Linde is the second-largest global industrial gas supplier worldwide. In the United States, Linde owns thirty-two ASUs and thirty-five carbon dioxide facilities. In 2017, Linde generated approximately \$20.2 billion in total revenue. Linde's 2017 U.S. revenue totaled approximately \$4.4 billion, of which about \$2.5 billion derived from its LinCare home healthcare business.

IV. THE RELEVANT MARKETS FOR BULK LIQUID OXYGEN, BULK LIQUID NITROGEN, AND BULK LIQUID ARGON

Oxygen, nitrogen, and argon are "atmospheric gases," present in the Earth's atmosphere in varying amounts. Industrial gas suppliers like Linde and Praxair produce atmospheric gases for a range of customer applications and industries, such as oil and gas, steelmaking, health care, and food manufacturing. Oxygen, nitrogen, and argon are three of the most widely used atmospheric industrial gases. Each atmospheric gas has specific properties that make it uniquely suited for its respective applications. For most of these applications, there is no substitute for oxygen, nitrogen, or argon.

Suppliers distribute atmospheric gases to customers in different forms and methods, depending on the volume of gas that the customer requires. Customers that require extremely large volumes receive atmospheric gases from on-site ASUs located at their facilities, or via pipelines connecting ASUs to customer sites. Bulk customers require gas volumes that are substantial, but not large enough to justify on-site or pipeline gas delivery. For bulk customers, suppliers typically transport bulk liquid oxygen, bulk liquid nitrogen, or bulk liquid argon in cryogenic trailers that hold the gas in liquid form. The liquid form is more condensed than the gaseous form, and therefore easier to transport and store in large quantities. Bulk liquid gases are then stored in tanks located at customer sites. From there, customers can use the product in its liquid form, or convert it back to its gaseous form before use. Small-volume customers purchase nitrogen, oxygen, or argon in cylinders containing the product in gaseous form. Typically, smaller customers receive gas cylinders from distributors that purchase products from industrial gas suppliers in bulk liquid form. It is impractical for bulk liquid oxygen, bulk liquid nitrogen, or bulk liquid argon customers to switch distribution methods, as their demand is too great to satisfy efficiently with cylinders, but too small to justify the expense of on-site or pipeline delivery.

For atmospheric gases, the ratio of the product's value to its transportation costs largely determines the relevant geographic market. Due to the relatively low sales prices of bulk liquid oxygen and bulk liquid nitrogen and the significant freight costs associated with transporting them, these gases can ship, economically, a maximum distance of approximately 100 to 250 miles from the ASU that produces the gas. Therefore, it is appropriate to analyze the competitive effects of the proposed merger in regional

geographic markets for bulk liquid oxygen and bulk liquid nitrogen. The relevant geographic markets in which to analyze the effects of the proposed merger upon bulk liquid oxygen and bulk liquid nitrogen are the following regions: (1) the Northeast; (2) the Mid-Atlantic; (3) Upstate and Western New York; (4) the Carolinas; (5) Northern Florida and Surrounding Areas; (6) Atlanta and Surrounding Areas; (7) the Pacific Northwest; (8) Northern California; (9) Southern California; (10) Arkansas and Surrounding Areas; (11) Northern Texas and Surrounding Areas; (12) Southern Texas; (13) the Central Gulf Coast; (14) the Eastern Midwest; (15) Greater Chicago; (16) Missouri and Surrounding Areas; and (17) Puerto Rico. Because bulk liquid argon is rarer and more expensive than bulk liquid oxygen and bulk liquid nitrogen, suppliers can transport it economically much greater distances. Therefore, the relevant geographic area in which to analyze the effects of the proposed merger on the bulk liquid argon market is the United States.

Each of the relevant markets for bulk liquid oxygen and bulk liquid nitrogen would become significantly more concentrated following the proposed merger. The proposed merger would consolidate two of the leading suppliers of bulk liquid oxygen and bulk liquid nitrogen in each of these areas. For bulk liquid argon, there are five significant suppliers in the United States. Praxair is the second-largest domestic producer of bulk liquid argon. The proposed merger would eliminate one of the largest suppliers and substantially increase concentration in the U.S. bulk liquid argon market, creating a highly concentrated market.

V. THE RELEVANT MARKETS FOR BULK LIQUID CARBON DIOXIDE

Carbon dioxide is a “process gas,” which means that it is captured as a by-product of other manufacturing processes, such as ethanol, ammonia, and hydrogen. Crude carbon dioxide also derives from natural sources, such as natural gas wells. Suppliers convert and distill crude carbon dioxide into final liquid form using a cryogenic process at plants often located near carbon dioxide gas sources. The most common applications for liquid carbon dioxide are in food and beverage production. For example, customers commonly use carbon dioxide in processes to carbonate beverages and chill or freeze food. For the majority of its applications, liquid carbon dioxide has no viable substitutes.

Suppliers deliver liquid carbon dioxide to customers in bulk trailers or rail cars. Most customers store liquid carbon dioxide in tanks located at their manufacturing facilities. Customers would not switch to cylinder delivery because bulk delivery is far cheaper, and they would have to manage significantly more deliveries to meet their needs. In addition, customers would not consider self-sourcing liquid carbon dioxide unless the cost increased significantly more than ten percent, because of the costs to build necessary infrastructure and the limited sources of carbon dioxide available.

Due to the significant freight costs associated with transporting liquid carbon dioxide relative to its sales price, suppliers can only ship liquid carbon dioxide economically up to 250 miles by truck. In areas with few or no carbon dioxide sources, liquid carbon dioxide is shipped as much as 750 miles by rail. Therefore, it is appropriate to analyze the competitive effects of the proposed merger in regional geographic markets for bulk liquid carbon dioxide. For bulk liquid carbon dioxide, the relevant geographic markets in which to analyze the effects of the proposed merger include the following regions: (1) Northern California; (2) Southern California; (3) the Southeast; (4) the Mid-

Atlantic; (5) the Rocky Mountains; (6) the Plains; (7) Southern Texas; (8) the Eastern Midwest; and (9) Greater Chicago.

The proposed merger would combine the largest and third-largest suppliers of bulk liquid carbon dioxide in the United States. In each relevant geographic market for bulk liquid carbon dioxide, the merged firm would control a high share of capacity. Further, Linde and Praxair are the two closest suppliers for numerous customers across multiple relevant geographic markets, and the merger would eliminate a close constraint on pricing of bulk liquid carbon dioxide.

VI. THE RELEVANT MARKET FOR BULK REFINED HELIUM

Both Linde and Praxair are suppliers of bulk refined helium. Bulk refined helium has specific properties that make it uniquely suited for its applications. For example, because helium has the lowest boiling point of any element, liquid helium is valuable as a cooling agent in superconductivity for medical applications, such as magnetic resonance imaging (“MRI”), and certain manufacturing applications. For most applications, there is no substitute for bulk refined helium, and customers are unlikely to switch to another gas or product, even if the price of bulk refined helium increased by five to ten percent.

Suppliers distribute refined helium to customers in cylinder form or bulk form, depending on the customers’ volume requirements. Customers that require large volumes of refined helium generally purchase the gas in bulk form. Suppliers often package bulk refined helium in containers called “dewars,” and then distribute the product in liquid form to customers. For customers that require helium in its gaseous state, suppliers can convert bulk refined helium from liquid to gaseous form. Suppliers distribute bulk quantities of gaseous helium in high-pressure “tube trailers.” Customers obtain helium in

bulk form because it is the most cost-effective way to purchase the high volume of refined helium that they require. Accordingly, customers would not switch distribution methods for their purchases of refined helium, even if the prices of bulk refined helium distributed by one method increased by five to ten percent.

Helium is a rare and expensive gas that can be, and is, transported economically on a worldwide basis. Capacity and demand for helium produced abroad influences the capacity and demand for helium produced domestically. Suppliers source helium primarily from a few large sources, and ship helium from those sources to customers around the world. Therefore, it is appropriate to analyze the competitive effects of the proposed merger using a worldwide market for bulk refined helium.

The market for bulk refined helium is highly concentrated. Linde and Praxair are two of only five companies in the world with access to significant quantities of bulk refined helium. The proposed transaction combines the largest and third-largest bulk refined helium suppliers in the world. Post-merger, the combined entity would control two-fifths of the global helium supply.

VII. THE RELEVANT MARKET FOR BULK LIQUID HYDROGEN

Hydrogen is a non-atmospheric gas produced as a by-product of other processes, including natural gas extraction and petrochemical production. Most crude hydrogen comes from third-party feedstocks. Industrial gas suppliers purify and liquefy crude hydrogen before distributing it to customers. Customers use liquid hydrogen for a range of applications across several industries. For example, liquid hydrogen has applications in space programs as a primary rocket fuel and as a propellant for nuclear powered

rockets and space vehicles, in hydrogenation and clean energy storage, and as an active ingredient in chemical manufacturing processes.

Customers that require very large quantities of hydrogen on a regular basis typically receive the gas via an on-site plant or pipeline. For customers that require a small amount of hydrogen, cylinders are most economical. Customers that require more hydrogen than can be practicably supplied with cylinders, but not enough volume to justify the costs of on-site or pipeline delivery, typically receive bulk liquid delivery. For most applications, there are no viable economic alternatives to bulk liquid hydrogen. Further, because distribution methods depend on volume requirements, customers cannot switch to cylinders or on-site distribution if bulk prices were to increase.

The relevant geographic market for bulk liquid hydrogen is national. The value of bulk liquid hydrogen relative to the cost of transportation is the primary factor in defining the relevant geographic market. Liquid hydrogen's high value and limited production allows suppliers to transport it over long distances economically and more efficiently than hydrogen in bulk gaseous form.

Linde and Praxair are two of just four main suppliers of bulk liquid hydrogen in the United States. The U.S. bulk liquid hydrogen market is highly concentrated, and Praxair is the largest producer of bulk liquid hydrogen in the United States. The proposed merger would remove one of the few bulk liquid hydrogen suppliers from the market.

VIII. THE RELEVANT MARKET FOR HYCO

HyCO is the industry term for the on-site provision of hydrogen and carbon monoxide gas. The same chemical process produces both gases, so one gas is always the

by-product of the other. Plants that produce hydrogen and carbon monoxide create a mixture called synthesis gas (or “syngas”), which producers separate into its constituent parts using a cryogenic process.

HyCO includes separate product markets for on-site hydrogen and carbon monoxide, because the two gases are not substitutes for each other. For most applications, there are no viable substitutes for hydrogen or carbon monoxide. Likewise, customers cannot substitute bulk delivery for on-site supply of hydrogen or carbon monoxide, and so on-site supply of these gases is a distinct product market, as well.

There are three main types of HyCO plants: (1) the steam methane reformer (“SMR”); (2) the partial oxidation plant (“POX”); and (3) the autothermal reformation plant (“ATR”). Each plant type produces different proportions of hydrogen and carbon monoxide. SMRs produce the highest proportion of hydrogen relative to carbon monoxide. POX and ATR plants produce these gases in more equal proportions. For most on-site hydrogen customers, suppliers build on-site SMRs; however, for customers that need on-site carbon monoxide, suppliers will typically construct POX or ATR plants. On-site HyCO customers usually conduct a competitive bidding process several years in advance of a plant’s opening. This bidding process is the source of most competition in the HyCO market. The customer and winning bidder typically enter into long-term contracts that lock-in prices and other terms.

The majority of HyCO plants in the United States are SMRs built for oil and petrochemical companies that only require hydrogen. Carbon monoxide customers are few in number, but large in size and gas needs—most are chemical companies that produce acetic acid, polyurethane, and other compounds. HyCO plants are expensive,

costing from \$30 million to over \$400 million, depending on size and type. The industrial gas supplier usually absorbs the cost of building the plant, and then yields the return from a long-term (fifteen to twenty year) supply contract with the customer. HyCO is a critical input for its customers' products, and HyCO plants often integrate into customers' production sites. Accordingly, HyCO customers require suppliers to have engineering and operational expertise, as well as a demonstrated history and reputation of successfully operating HyCO plants.

Relevant geographic markets for on-site hydrogen and carbon monoxide are national. HyCO suppliers are generally able to serve customers in all areas of the country. The Gulf Coast region is a distinct submarket within the broader national markets for on-site hydrogen and carbon monoxide, as it has the highest concentration of HyCO customers anywhere in the United States. There, hydrogen pipelines serve multiple customers from a single HyCO plant or serve as backup. Hydrogen pipelines allow HyCO suppliers to offer customers lower prices than they could with a dedicated on-site plant at the customer's location. Consequently, HyCO suppliers are only competitive in areas of the Gulf Coast where they have hydrogen pipeline networks.

U.S. markets for on-site hydrogen and carbon monoxide are highly concentrated. Praxair is a market leader, and Linde represents one of a limited number of viable alternative HyCO suppliers. The proposed merger would remove one of the few HyCO suppliers from the market.

IX. THE RELEVANT MARKET FOR EXCIMER LASER GASES

Excimer laser gases are a subset of specialty gases commonly used to serve customers in the electronics industry, such as semiconductor or liquid crystal display

manufacturers. Excimer lasers use gas mixtures, typically containing multiple noble gases (e.g., neon, krypton, or xenon) and, occasionally, a halogen gas (e.g., fluorine or chlorine). Suppliers of excimer laser gases produce or source noble and halogen gases worldwide, then purify and blend these gases into products that they distribute to customers in cylinders. Neon comprises 95 to 99 percent of most excimer laser gases, with other rare and halogen gases making up the remainder. Neon, krypton, and xenon are present in the air in extremely small amounts, and industrial gas companies produce them only at very large ASUs with specialized equipment to capture these trace gases.

The semiconductor industry is the main customer base for excimer laser gases in the United States. Excimer laser gases generate ultraviolet light in excimer lasers, a component of photolithography machines. In addition, excimer laser gases have applications in annealing processes to produce display screens and for medical ablation, a minimally invasive process that cuts human tissue with minimal scarring (e.g., LASIK vision surgery).

The relevant geographic market for excimer laser gases is at least as broad as the United States. U.S. suppliers ship excimer laser gases to customer sites around the country and the world. Suppliers source excimer laser gas inputs, such as neon, domestically and internationally. Although international customers may not distinguish between excimer laser gases produced domestically or abroad, U.S. excimer laser gas customers prefer suppliers that have domestic production facilities and sources of neon.

Before supplying excimer laser gases to customers, suppliers must complete qualification processes with both laser manufacturers and individual customers to ensure that their excimer laser gases meet purity, quality, and other specifications. Each

qualification takes three to eighteen months, and costs at least \$125,000. Customers cannot switch from excimer laser gases to another product because there is no substitute that produces the same wavelength of light, and switching to another supplier often requires additional qualifications, resources, and time.

The market for excimer laser gases in the United States is highly concentrated. Linde and Praxair have a combined share of approximately 70 percent in this market, and the proposed merger would reduce the number of domestic suppliers from four to three.

X. EFFECTS OF THE ACQUISITION

The proposed merger would eliminate direct and substantial competition between Praxair and Linde in each of the relevant markets, provide the merged firm with an enhanced ability to increase prices unilaterally, and eliminate a competitor for gas customers in markets where alternative sources of supply are limited. The proposed merger, therefore, likely would allow the merged firm to exercise market power unilaterally, increasing the likelihood that purchasers of bulk liquid oxygen, bulk liquid nitrogen, bulk liquid argon, bulk liquid carbon dioxide, bulk liquid hydrogen, bulk refined helium, on-site hydrogen, on-site carbon monoxide, and excimer laser gases would pay higher prices in the relevant areas.

The proposed merger would also enhance the likelihood of collusion or coordinated action among remaining firms in these relevant markets, because the merger would eliminate a significant competitor from each market, leaving a small number of viable competitors. In addition, certain market conditions, such as the relative homogeneity of suppliers and products, and the transparency of detailed market information, are conducive to coordination among competing suppliers. These conditions

also enhance the ability of competitors engaged in a coordinated scheme to detect and punish deviations from the scheme.

XI. ENTRY

New entry into the relevant markets would not occur in a timely manner sufficient to deter or counteract the likely adverse competitive effects of the proposed merger. Entry into the bulk liquid oxygen, nitrogen, and argon markets is costly, difficult, and unlikely because of, among other things, the time and cost required to construct the ASUs that produce these products. Constructing an ASU at a scale sufficient to be viable in the market would cost at least \$30 to \$100 million, most of which are sunk costs. Moreover, it is not economically justifiable to build an ASU unless a significant amount of the plant's capacity has been pre-sold prior to construction, either to an on-site customer or to customers with commitments under contract. Such pre-sale opportunities occur infrequently and unpredictably and can take several years to secure.

Entry into the bulk liquid carbon dioxide market would also not be timely, likely, or sufficient to deter or counteract the adverse competitive effects of the proposed merger. Constructing a plant capable of producing bulk liquid carbon dioxide would cost at least \$5 to \$30 million. In addition, successful entry into the bulk liquid carbon dioxide market requires access to raw carbon dioxide supply sources, which are typically unavailable due to long-term contracts with incumbent liquid carbon dioxide suppliers.

New entry into the bulk liquid hydrogen market is unlikely to be timely or sufficient to counteract the proposed transaction's likely anticompetitive effects. Liquid hydrogen production facilities require years to construct and considerable capital to finance. Further, customers require liquid hydrogen suppliers to have backup supply and

be able to deliver product to their sites. A firm is more likely to succeed if it has a portfolio of diversified liquid hydrogen sources, as well as a reliable distribution network, which would require substantial time, resources, and investments to obtain.

Timely, sufficient entry into the bulk refined helium market is extremely unlikely, if not impossible. The most significant impediment to entry is securing a source of refined helium. A new entrant would need to secure multiple sources of refined helium, acquire necessary transportation and storage equipment, and establish a distribution infrastructure. Market incumbents secure all available sources of refined helium in long-term contracts. A new entrant would need to locate a new source of crude helium and build a refinery. In addition, an entrant would need to invest tens of millions of dollars to acquire necessary infrastructure and distribution assets, including transfills, cryogenic storage trailers, high-pressure tube trailers, and liquid dewars capable of transporting helium from the refinery to customers. Given the substantial costs and challenges of entering the bulk refined helium market, new entry sufficient to counteract the competitive effects of the proposed merger would not occur in a timely manner.

Entry into the HyCO market requires engineering expertise, experience in designing and operating the various types of HyCO plants, significant capital resources, and a proven record of success with HyCO customers. It would take several years and substantial investments for a new entrant to develop the expertise, experience, reputation, and credibility necessary to compete in the HyCO market. A new HyCO facility costs \$30 to \$300 million, depending on the plant size and product mix. Further, in the Gulf Coast, a hydrogen pipeline is an added barrier to enter the HyCO market. Existing pipelines are scarce in this region, and building a new pipeline requires substantial time

and resources that few firms have. Finally, opportunities to compete for new or existing HyCO customers are limited, as HyCO supply contracts are long-term, and customers invariably award contracts to proven suppliers.

New entry sufficient to deter or avert the proposed merger's anticompetitive effects in the market for excimer laser gases is unlikely to occur. The principal barrier to new entry is sourcing neon, which accounts for just 0.0018 percent of the Earth's atmosphere. Suppliers can produce neon efficiently only at the largest ASUs, which must have a neon gas column. Such an ASU would take several years and cost hundreds of million dollars to construct. In addition, an entrant would have to produce or otherwise secure other input gases, as well as supply, logistics, and distribution infrastructure and employees. An entrant would also have to construct a facility to blend excimer laser gases. Finally, an entrant would have to qualify its products with laser manufacturers and customers, which involves testing gas blends at a customer plants. The costs of entry would be difficult to justify, as the total U.S. excimer laser gas market is only around \$40 million.

XII. THE CONSENT AGREEMENT

The proposed Consent Agreement aims to eliminate the competitive concerns that the proposed merger raises in each relevant market. It requires Linde to divest to Messer all thirty-two of its U.S. ASUs, along with related equipment, supply contracts, technology, and goodwill, in the seventeen bulk liquid oxygen and nitrogen markets at issue in this matter. With the divestitures, the merger will not increase concentration in any market for bulk liquid nitrogen, oxygen, or argon. As part of the divestiture, Messer

will acquire all of Linde's customer contracts and bulk tanks located at the customer locations.

The proposed Consent Agreement also requires Linde to divest to Messer sixteen carbon dioxide facilities, including production plants and all associated rail depots. Linde will divest all existing contracts with customers supplied by the respective carbon dioxide facilities. Additionally, all assets used to support the distribution of bulk liquid carbon dioxide will be part of the divestiture, including trailers, tractors, and rail cars.

Linde must also divest to Messer its entire bulk liquid hydrogen business, which includes Linde's liquid hydrogen production facility in Magog, Quebec, source agreements, and four hydrogen transfills. Linde will divest all assets related to the bulk liquid hydrogen business including, among other things, employee contracts and information, customer and supply contracts, leases, distribution trailers, and equipment necessary to distribute bulk liquid hydrogen.

The proposed Consent Agreement requires Linde to divest to Messer all of Linde's U.S. bulk refined helium business, as well as global helium sourcing contracts, which, when combined with divestitures in other jurisdictions, are equal to Praxair's current worldwide helium capacity. In addition, Linde will divest its entire network of helium transfills across the United States. All of Linde's helium customer contracts in the United States, Canada, Brazil, Colombia, and Chile are included in the divestiture. The proposed Consent Agreement also provides Messer with the requisite number of dewars, tube trailers, and helium ISO containers to serve its helium customers worldwide.

The proposed Consent Agreement also requires Linde to divest to Matheson five on-site hydrogen SMRs to Matheson, along with Linde's hydrogen pipeline in the Gulf

Coast and all relevant customer contracts. The proposed divestiture includes Linde's SMR facilities in Anacortes, Washington; Lemont, Illinois; Lima, Ohio; McIntosh, Alabama; and Saraland, Alabama. The SMR assets also include Linde's Remote Operating Center in La Porte, Texas, the "control center" for Linde's on-site hydrogen business. In addition, Linde will divest its POX plants in Clear Lake, Texas, and La Porte, Texas, back to their customers, Celanese and LyondellBasell, respectively. This divestiture will resolve the competitive issues that these customers would otherwise face post-merger, as they will be able to operate the facilities themselves or contract with one of the firms with a nearby hydrogen pipeline.

To address competitive concerns in the market for excimer laser gases, the proposed Consent Agreement also requires Linde to divest to Messer all of Linde's customer contracts, intellectual property, and key Linde staff to sustain business operations and customer relationships. Neon-producing ASUs will also be included in the asset package. To ensure a seamless transfer, Linde has agreed to supply its finished excimer laser gas products to Messer for a period of three years (with possible extensions of time). This supply agreement will give Messer sufficient time to construct or renovate a facility and obtain OEM and customer certification. The proposed Decision and Order also requires Linde to underwrite the cost of building Messer's new facility. If Messer does not commence construction of the plant within one year, then Linde must rescind its sale of the excimer laser gas business to Messer and divest it to a Commission-approved acquirer.

Linde and Praxair have agreed to divest the required facilities, together with all related equipment, customer and supply contracts, technology, and goodwill, to one or

more Commission-approved buyers within four months of consummating the proposed merger. All acquirers of divested assets must receive the prior approval of the Commission. The Commission's goal in evaluating possible purchasers of divested assets is to maintain the competitive environment that existed prior to the acquisition.

The proposed Consent Agreement incorporates an Order to Hold Separate and Maintain Assets ("Order to Hold Separate") to ensure that Linde and Praxair (1) continue to operate separately until the divestitures to Messer and Matheson have been completed and (2) continue to maintain all assets until the required divestitures have been completed. The Order to Hold Separate appoints Grant Thornton LLP as monitor to oversee compliance with all the obligations and responsibilities under the proposed Decision and Order and requires Linde to execute an agreement conferring upon the monitor all of the rights, powers, and authorities necessary to permit the monitor to ensure the continued health and competitiveness of the divested businesses. Further, if the parties fail to divest the assets as required within the time specified, the Commission may appoint a divestiture trustee to divest the assets in a manner consistent with the proposed Decision and Order and subject to Commission approval.

The purpose of this analysis is to facilitate public comment on the proposed Consent Agreement, and it is not intended to constitute an official interpretation of the proposed Consent Agreement or to modify its terms in any way.

By direction of the Commission, Commissioner Chopra dissenting.

Donald S. Clark
Secretary.

Statement of Commissioner Rohit Chopra

Today, the FTC is proposing to impose conditions on a merger between Praxair, Inc. (NYSE: PX) and Linde AG (FWB: LIN), the world's second- and third-largest industrial gas suppliers. While these firms may not be household names, they provide inputs to an enormous number of industrial and consumer products throughout our economy. The merger would be clearly anticompetitive in violation of the Clayton Act, with a high likelihood of harming manufacturers of a wide range of industrial and consumer products.

The Commission is proposing to order substantial divestitures across multiple lines of businesses. Notably, Linde is divesting the vast majority of its U.S. industrial gas business to a joint venture between Messer Group GmbH and CVC Capital Partners, a private equity firm. Separately, Linde will also divest other assets to Matheson Tri-Gas, Inc. While the divestitures go a long way to address the anticompetitive concerns, the decision to approve this remedy was still a close call.

The transaction, as originally structured, does not appear to have any significant merger-specific efficiencies that would guarantee benefits to customers. However, the proposed order requires substantial divestitures that might preserve or even increase competition in some product markets. But even with the proposed remedies, this transaction is not without risks to competition. In particular, I would have preferred to include additional protections for the public to safeguard against risks often posed by the private equity buyer interest in the divested assets, as well as the level of debt financing and investment horizons involved.

Divestiture Buyer Financing

Competition enforcers, including the FTC, should always examine whether its merger remedies have been successful over the long term. The FTC's 2017 Merger Remedies study highlighted some of the lessons learned from past merger remedies.¹

When evaluating the suitability of a divestiture buyer, agencies must determine whether the buyer can meaningfully replace competitive market forces eliminated by a merger. For example, agencies need to be confident that the buyer possesses the know-how and technical capabilities to successfully operate the divested businesses. Among other things, the 2017 study found that the success of a divestiture over time depends, in part, on whether the buyer has adequate financing to ensure success. Given recent trends in our capital markets, we need to carefully scrutinize buyer financing.

In situations like the matter before us, I approached this line of inquiry with several questions in mind:

(1) Does the deal's financing structure allow the buyer to make significant investments to maintain and grow their business in order to vigorously compete? Does the buyer have adequate liquidity to be a nimble and opportunistic competitor?

(2) What is the buyer's level of debt financing, compared to others in the industry? Have creditors protected themselves in ways that are aligned – or misaligned – with the goal of preserving competition?

¹ See The FTC's Merger Remedies 2006-2012, A Report of the Bureaus of Competition and Economics, Federal Trade Commission, January 2017, *available at*: <https://www.ftc.gov/reports/ftcs-merger-remedies-2006-2012-report-bureaus-competition-economics>

(3) Does the buyer's financing and governance structure create temptations to make asset sales that would reduce competition?

As noted above, in this matter one of the divestiture buyers, MG Industries, is a new joint venture between Messer Group GmbH, a major industrial gas company, and CVC Capital Partners, a private equity firm.

In this situation, I would have preferred terms in the proposed order that would have required prior notice to or approval by the Commission of any asset sales by MG Industries. There is past Commission precedent for doing so. In situations where there was a risk that the divestiture buyer may subsequently sell assets it acquired pursuant to a divestiture order, the Commission has sometimes ordered the divestiture buyer to agree to a prior approval provision covering any sale of the assets acquired for a defined period of time.

For example, in the Koninklijke Ahold and Delhaize Group matter, due to concern that one of the divestiture buyers (Supervalu) might later transact acquired stores, the Commission required Supervalu to seek prior approval for any such transfer of the divested stores for a period of three years.²

In the Nestle Holdings, Inc. and Ralston Purina Co. matter, the Commission required the divestiture buyer (a private equity fund) to seek approval by the Commission

² In the Matter of Koninklijke Ahold and Delhaize Group, C-4588 (Consent) (July 22, 2016), available at: <https://www.ftc.gov/enforcement/cases-proceedings/151-0175/koninklijke-ahold-delhaize-group>.

prior to the sale of certain assets held less than five years.³ The buyer would later seek permission from the Commission to sell assets, reducing the likelihood of needing to litigate an anticompetitive transaction.

Special Considerations with Financial Buyers

Private equity funds continue to play a greater role in deal activity across the globe. Notably, private equity participation is associated with higher levels of debt financing, which can amplify both risk and returns on equity. At the most basic level, heavy debt burdens can increase the likelihood of insolvency. Private equity participation is also associated with other firm behavior that can reduce long-term competition, including opportunistic asset sales. This risk may be more acute when funds purchase assets in unusual and distressed situations.

Enforcers must carefully examine investors' unique incentives that can drive firm behavior in ways that affect competition. To assess these incentives, we must always actively probe the entire circumstances of investor involvement in a merger transaction under review. For example, what is the buyer's investment thesis and strategy? How has the investor typically realized gains out of past investments? Does the buyer plan to invest more of its own equity capital into the business or simply further rely on debt financing? When and how does the investor intend to exit its investment? Given all of this, what really is the long-term impact on competition?

While Commission staff certainly ask many of these questions in their review of divestiture buyers, it will be important to ensure that we are conducting careful and

³ In the Matter of Nestle Holdings, Inc., and Ralston Purina Company, C-4028 (Consent) (December 11, 2001), available at: <https://www.ftc.gov/enforcement/cases-proceedings/0110083/nestle-holdings-inc-ralston-purina-company>.

adequate due diligence with respect to buyers that are heavily reliant on debt financing and where investment firms exert significant control.

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